



Intelligent Energy Valves for Hydronic Systems System

What is this Technology?

This technology reduces the power consumed by pumps in hydronic heating and cooling systems by maintaining an optimal temperature difference (Delta-T) between fluid supply and return lines. Low Delta-T is a common problem in the control of central plant systems. During part-load conditions, which occur most of the time, hydronic coils function at a lower Delta-T than is specified by system design. This results in the pumping of more water than would otherwise be necessary to heat or cool the air. This technology, a pressure-independent control valve with an integrated BTU meter, monitors hydronic coil performance and maintains optimal Delta-T under all load conditions, reducing water flow and saving pump energy consumption.

Why is GSA Interested?

GSA spends an estimated \$105 million annually on heating and cooling its buildings. Intelligent energy valve technology promises to decrease that expenditure by reducing the energy required by circulating pumps in hydronic systems. This technology also reduces the amount of time boilers and chillers spend online, thereby extending their operational lives.



ENERGY EFFICIENCY By reducing the flow of water pumped through the hydronic system, the intelligent energy valve can reduce pump energy consumption by 30%.



COST-EFFECTIVENESS This technology reduces operational costs by lowering pump energy consumption and extending the operational life of central plant equipment. The manufacturer estimates payback of less than four years.



OPERATIONS & MAINTENANCE O&M savings may result from reduced equipment operating hours, longer maintenance intervals, and more efficient monitoring and control of water flow.



DEPLOYMENT POTENTIAL Intelligent energy valve technology will be most effective in facilities with hydronic systems that spend at least half of their operating time with a fluid temperature drop across the coils that is 50% or less than the design-specified Delta-T.

The Green Proving Ground program has commissioned Oak Ridge National Laboratory to perform real-world measurement and verification of intelligent energy valves for hydronic systems in a pilot installation in a federally owned building within GSA's inventory.



The Green Proving Ground program leverages GSA's real estate portfolio to test innovative building technologies. The program helps GSA meet its sustainability goals by providing actionable data that informs investment decisions targeted at energy-use reduction.